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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,885	07/12/2001	Arvind Halliyal	F0612	2018

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AMIN & TUROCY, LLP  
1900 EAST 9TH STREET, NATIONAL CITY CENTER  
24TH FLOOR,  
CLEVELAND, OH 44114

EXAMINER

BARTH, VINCENT P

ART UNIT PAPER NUMBER

2877

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/903,885	<b>Applicant(s)</b> HALLIYAL ET AL.	
	<b>Examiner</b> Vincent P. Barth	<b>Art Unit</b> 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-7 and 15 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Basis for Nonstatutory Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8-14 are rejected under the judicially created obviousness-type double patenting as being unpatentable over claims 8 and 9 of Singh, et al., U.S. Pat. No. , 6,561,706 (13 May 2003), in view of Sung, et al., U.S. Pat. No. 6,124,178 (26 Sept. 2000).
3. Referring to Claims 8 and 10, Singh claims a method for controlling post exposure development wherein the wafer is divided into a plurality of parts, light is directed onto the wafer, the light is collected from the latent image (claim 8, col. 16, lns. 13-21). Clearly, passing light through the wafer as set forth in instant Claim 10, as opposed to reflecting from the wafer, merely depends upon the translucency of the substrate, not the methods *per se*. Singh discloses that the properties of the properties measurable on the wafer by the system are, *inter alia*, “chemical composition” (col. 12, ln. 34), and that, “the latent image is indicative of at least one parameter of exposure (e.g., chemical composition changes ...)” (col. 2, lns. 52-54). Said latent image and exposure are the limitations found in claim 8 of Singh, thus these terms may derive their definitions from the language in the disclosure. The limitation in instant Claim 8 wherein nitrided gate oxide layers are measured and controlled is not explicitly found in Singh claim 8. However, it is clear that the formation 660 in Figure 6 (described in the Singh disclosure as a grating) could easily be a nitrided gate oxide layer in an alternative embodiment. Indeed, Figure

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2 in the instant Application is nearly an identical copy of that found in Singh Figure 6, except that the instant Application includes formers (elements 42 in Figure 2), and element 660 from Singh Figure 6 is re-labeled as element 24 (a gate oxide layer) in Figure 2 of the instant Application. Although Singh does not explicitly disclose or claim that the a gate oxide layer is present, when such a structure is present, Singh explicitly discloses that the chemical composition of such structure is measurable (col. 12, ln. 34). Thus, the issue is whether forming nitrided gate oxide layers has been known in the art, and whether those of ordinary skill in the art would be motivated to take such measurements of nitrogen concentration. It has been generally known in the art that controlling the nitrogen concentration in a gate oxide layer would be useful, and that therefore measurements of such concentration would be similarly useful. See MPEP §2144.03. That the chemical composition of the structures deposited on semiconductor wafers is a useful parameter is also evidenced by the disclosure in Singh, in which the “chemical composition” of the deposited materials may be measured (col. 12, ln. 34). In the alternative, the choice of nitrogen as a chemical element to measure in surface deposits represents a non-critical limitation. The Specifications in the instant Application do not disclose why such choice of materials is a critical limitation over the prior art. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Accordingly, this feature would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. Singh does not claim or disclose that the gate oxide layers are created by so-called “formers”, as the term is used in the instant Application. However, the instant Specification at page 8 indicates that a typical former such as a CVD may be used. Sung discloses that a CVD may be used to

form a gate oxide layer (col. 3, lns. 18-20). Singh and Sung are analogous art, since they are from a similar problem solving area, in that each involves measuring and controlling formations on a semiconductor wafer. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for doing so would have been to more explicitly illustrate the means for forming the gate oxide layer. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefit.

4. Referring to Claims 9 and 11, Singh claims that analyzing the reflected light comprises using scatterometry to process the light (claim 8, col. 16, ln. 31). Clearly, passing light through the wafer as set forth in instant Claim 11, as opposed to reflecting from the wafer, merely depends upon the translucency of the substrate, not the methods *per se*.

5. Referring to Claims 12 and 13, Singh claims that “analyzing” the reflected light comprises scatterometry (claim 9, col. 16, ln. 31), and wherein the disclosure in Singh in Figure 6 indicates that said analysis is completed by means of a processor 605.

6. Referring to Claim 14, Singh claims a method for controlling post exposure development wherein the wafer is divided into a plurality of parts, light is directed onto the wafer, the light is collected from the latent image (claim 8, col. 16, lns. 13-21). Clearly, passing light through the wafer as set forth in instant Claim 10, as opposed to reflecting from the wafer, merely depends upon the translucency of the substrate, not the methods *per se*. Singh discloses that the properties of the properties measurable on the wafer by the system are, *inter alia*, “chemical composition” (col. 12, ln. 34), and that, “the latent image is indicative of at least one parameter of exposure (e.g., chemical composition changes ...)” (col. 2, lns. 52-54). Said latent image and

exposure are the limitations found in claim 8 of Singh, thus these terms may derive their definitions from the language in the disclosure. The limitation in instant Claim 8 wherein nitrided gate oxide layers are measured and controlled is not explicitly found in Singh claim 8. However, it is clear that the formation 660 in Figure 6 (described in the Singh disclosure as a grating) could easily be a nitrided gate oxide layer in an alternative embodiment. Indeed, Figure 2 in the instant Application is nearly an identical copy of that found in Singh Figure 6, except that the instant Application includes formers (elements 42 in Figure 2), and element 660 from Singh Figure 6 is re-labeled as element 24 (a gate oxide layer) in Figure 2 of the instant Application. Although Singh does not explicitly disclose or claim that the a gate oxide layer is present, when such a structure is present, Singh explicitly discloses that the chemical composition of such structure is measurable (col. 12, ln. 34). Thus, the issue is whether forming nitrided gate oxide layers has been known in the art, and whether those of ordinary skill in the art would be motivated to take such measurements of nitrogen concentration. It has been generally known in the art that controlling the nitrogen concentration in a gate oxide layer would be useful, and that therefore measurements of such concentration would be similarly useful. See MPEP §2144.03. That the chemical composition of the structures deposited on semiconductor wafers is a useful parameter is also evidenced by the disclosure in Singh, in which the “chemical composition” of the deposited materials may be measured (col. 12, ln. 34). In the alternative, the choice of nitrogen as a chemical element to measure in surface deposits represents a non-critical limitation. The Specifications in the instant Application do not disclose why such choice of materials is a critical limitation over the prior art. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Accordingly, this feature would

have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. Singh does not claim or disclose that the gate oxide layers are created by so-called “formers”, as the term is used in the instant Application. However, the instant Specification at page 8 indicates that a typical former such as a CVD may be used. Sung discloses that a CVD may be used to form a gate oxide layer (col. 3, lns. 18-20). Singh and Sung are analogous art, since they are from a similar problem solving area, in that each involves measuring and controlling formations on a semiconductor wafer. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for doing so would have been to more explicitly illustrate the means for forming the gate oxide layer. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefit. Singh claims that “analyzing” the reflected light comprises scatterometry (claim 9, col. 16, ln. 31), and wherein the disclosure in Singh in Figure 6 indicates that said analysis is completed by means of a processor 605.

### *Comments*

7. Examiner Jimmy Nguyen initiated a telephone restriction with Attorney Gregory Turocy on 21 May 2003, in which an election was made with traverse to prosecute the method Claims 14-20. Please note that based on such election, Examiner Nguyen transferred the instant Application to Examiner Barth. Accordingly, and as noted below in the section entitled Conclusion, Examiner Barth has examined Claims 14-20, rather than Examiner Nguyen.



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Affirmation of this election must be made by Applicants in replying to this Office action.

Claims 1-13 and 21 are withdrawn from further consideration by the Examiner, pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicants have submitted three references in an IDS dated 31 August 2001, which have been considered by the Examiner. However, none of the references have dates of publication listed on form PTO-1449, and such dates are not apparent on the document. Only the IBM document has a year of publication, but not the month or day. Accordingly, at least the month and year of publication, as well as the place of publication (i.e., journal title, or conference location, etc.) must be furnished. See MPEP §609(III) at page 600-121 and 37 CFR §1.98(b)(5).

### *CONCLUSION*

9. Applicants' Claims 8-14 are rejected based on the reasons set forth above.

10. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 703-605-0750, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9318.

11. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 703-308-4881.

12. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Richard A. Rosenberger  
Primary Examiner